



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,777	02/20/2002	Shigeki Matsuda	111995	3646
25944 7590 12/31/2009 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
WONG, EDNA				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
12/31/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/077,777

Applicant(s)

MATSUDA ET AL.

Examiner

EDNA WONG

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,8,10-13,15,16 and 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8,10-13,15,16 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ ~~Notice of Informal Patent Application~~
- 6) ☐ Other: _____

This is in response to the Amendment dated November 30, 2009. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Claim Objections

Claim 19 has been objected to because of minor informalities.

The objection of claim 19 has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 112

I. Claims **1-5, 8, 10-16 and 19** have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The rejection of claims 1-5, 8, 10-16 and 19 under 35 U.S.C. 112, first paragraph, has been withdrawn in view of Applicants' amendment.

II. Claims **1-5, 8, 10-16 and 19** have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 1-5, 8, 10-16 and 19 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

III. Claims **1-5, 8, 10-16 and 19** have been rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between the phosphate chemical treatment bath, the electrolytic treatment bath and the treatment liquid.

The rejection of claims 1-5, 8, 10-16 and 19 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

IV. Claims **1-5, 8, 10-16 and 19** have been rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between the circulating and exposing steps.

The rejection of claims 1-5, 8, 10-16 and 19 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

Claims **1-5, 8, 10-16 and 19** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **EP 1,074,640 A1** ('640) in combination with **Matsuda** (US Patent No. 5,645,706).

With regards to claim **14**, the rejection under 35 U.S.C. 103(a) as being unpatentable over EP 1,074,640 A1 ('640) in combination with Matsuda has been withdrawn in view of Applicants' amendment. Claim 14 has been cancelled.

With regards to claims **1-5, 8, 10-13, 15-16 and 19**, the rejection under 35 U.S.C. 103(a) as being unpatentable over EP 1,074,640 A1 ('640) in combination with Matsuda is as applied in the Office Actions dated September 28, 2007, April 9, 2008 and May 29, 2009 and incorporated herein. The rejection has been maintained for the following reasons:

Applicants state that EP 640 relates to an invention that improves a problem in Matsuda. The improvement is to suppress metal ions other than those that are a component of the film, such as Na ions, in the bath. EP 640 does not describe control of an amount of Fe^{3+} ions dissolved in the treatment bath so that the treatment bath does not contain Fe^{3+} ions in an amount of more than the solubility limit (and thus sludge is not formed).

In response, EP '640 teaches that:

Another factor that determines the upper limit is the "practical viewpoint". ***This is based on the fact that chemical concentrations are typically required to be low.*** Judging from this viewpoint, an upper limit of the "concentration of metal (Zn, Fe, Mn, etc.) component ions that become phosphate and enter the film (g/l)/(concentration of

phosphate ions and phosphoric acid (g/l))" of about 4 is considered to be reasonable. ***(However, since Fe ions cannot exist in solution as ferrous ion (Fe^{2+}) but only as ferric ion (Fe^{3+}), and ferric ions have strong coagulating properties that result in the formation of sludge when added to the treatment bath, they cannot be used in the replenishing liquid.)*** [page 21, [0203]].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by EP '640 by controlling the amount of Fe ions dissolved in the phosphate chemical treatment bath by changes in the amount of Fe ions dissolved into the phosphate chemical treatment bath so that the phosphate chemical treatment bath does not contain Fe^{3+} ions in an amount of more than the solubility limit because ferric ions (Fe^{3+}) have strong coagulating properties that would have resulted in the formation of sludge when added to the treatment bath as taught by EP '640 (page 21, [0203]).

The reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), *cert. denied*, 500 US 904 (1991) [MPEP § 2144].

Applicants state that the phrase " Fe^{3+} is stably present in the bath" means that Fe^{3+} is continuously and stably supplied to the bath. It does not mean that the amount of Fe^{3+} ions dissolved in the treatment bath is controlled so that the treatment bath does not contain Fe^{3+} ions in an amount of more than the solubility limit.

In response, EP '640 teaches that:

Another factor that determines the upper limit is the "practical viewpoint". This is based on the fact that chemical concentrations are typically required to be low. Judging from this viewpoint, an upper limit of the "concentration of metal (Zn, Fe, Mn, etc.) component ions that become phosphate and enter the film (g/l)/(concentration of phosphate ions and phosphoric acid (g/l))" of about 4 is considered to be reasonable. (However, since Fe ions cannot exist in solution as ferrous ion (Fe^{2+}) but only as ferric ion (Fe^{3+}), and ferric ions have strong coagulating properties that result in the formation of sludge when added to the treatment bath, ***they cannot be used in the replenishing liquid.***) [page 21, [0203]].

If ferric ions (Fe^{3+}) cannot be used in the replenishing liquid, then they would not have been continuously and stably supplied to the bath.

Applicants state that in Matsuda, Fe^{3+} is continuously and stably supplied in the bath. As a result, in Matsuda, sludge is inevitably formed because the solubility product of $\text{Fe}(\text{OH})_3$ is smaller than that of $\text{Fe}(\text{OH})_2$ and an amount of Fe ions dissolved in the bath is not controlled. Accordingly, the sludge formed in the bath must be removed.

In response, Matsuda teaches that:

However, ***since according to the present invention electrical energy is supplied by the electrolytic treatment, the iron is dissolved and oxidized by Chemical Equations 3 and 10, causing the treatment bath to contain both Fe^{2+} and Fe^{3+} , and so the ORP may be 560 mV or greater. In addition, the reaction of the formation of the film (Chemical Equation 4) is also promoted, and thus the formation of the chemical film takes place. Since Fe^{3+} is stably present in the bath with an ORP of 560 mV or greater, the chemical treatment coating which is formed is assumed to be a phosphate chemical coating including iron in the form of both Fe^{2+} and Fe^{3+}*** (col. 13, lines 48-57).

EP '640 teaches that:

Another factor that determines the upper limit is the "practical viewpoint". ***This is based on the fact that chemical concentrations are typically required to be low.***

Judging from this viewpoint, an upper limit of the "concentration of metal (Zn, Fe, Mn, etc.) component ions that become phosphate and enter the film (g/l)/(concentration of phosphate ions and phosphoric acid (g/l))" of about 4 is considered to be reasonable. ***(However, since Fe ions cannot exist in solution as ferrous ion (Fe^{2+}) but only as ferric ion (Fe^{3+}), and ferric ions have strong coagulating properties that result in the formation of sludge when added to the treatment bath, they cannot be used in the replenishing liquid.)*** [page 21, [0203]].

Since electrical energy is supplied by the electrolytic treatment, the iron is dissolved and oxidized causing the treatment bath to contain both Fe^{2+} and Fe^{3+} . Those Fe^{3+} ions would have been already stable in the bath because the ORP was 560 mV or greater. However, no further amount of Fe^{3+} ions would have been added to the bath because ferric ions (Fe^{3+}) have strong coagulating properties that would have resulted in the formation of sludge when added to the treatment bath, they cannot be used in the replenishing liquid.

Applicants state that EP 640 also fails to describe or suggest the specific method for removing NO_2 and/or N_2O_4 generated and dissolved in the treatment bath during the electrolytic treatment as required in claim 1, wherein removal is effected by separating a treatment tank into an electrolytic treatment tank where the electrolytic treatment is carried out and an auxiliary tank where no electrolytic treatment is carried out, circulating the treatment bath between the two tanks, and providing a mechanism that opens the treatment bath to the atmosphere at a reduced pressure either between the two tanks or within the two tanks. EP 640 merely describes thermodynamically stabilizing the treatment bath or removing solids from the treatment bath (see claims 24 and 25).

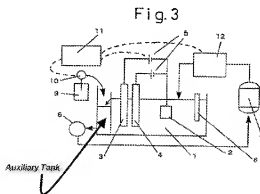
In response, EP '640 teaches that:

It is preferable to remove a portion of the phosphate chemical treatment bath from a bath tank having the phosphate chemical treatment bath, and remove the solids that precipitated during phosphate chemical treatment during the course of the film formation reaction, followed by returning it to the bath tank (page 9, [0075]).

As a result of using this method, for example, unavoidably formed reaction products (sludge) and ***nitrides (such as NO₂) formed by reduction of nitrate ion other than on the surface of the article to be treated by the electrolysis reaction can be removed from the treatment bath***. Consequently, superfluous reactions other than the reaction for film formation can be inhibited in the treatment bath (page 9, [0076]).

In addition, 5 is a power supply that applies a voltage between the article to be treated 2 and working electrodes 3 and 4, 6 is a filtration/circulation pump for removing a portion of phosphate chemical treatment bath 1 from inside the bath tank containing phosphate chemical treatment bath 1 and thermodynamically stabilizing the energy state as liquid of phosphate chemical treatment bath 1, and 7 is a filter that removes solids that have precipitated in phosphate chemical treatment bath 1 during the course of the film formation reaction (page 19, [0177]).

The divided tank disclosed by EP '640 is open to the atmosphere:



(Fig. 3).

There is no reason why the openness of the divided tank would not have been a means of separating the NO₂ and/or N₂O₄ gas from the treatment bath. The mechanism is the same as presently claimed.

Applicants state that EP 640 discloses only a phosphate treatment method in which pH is broadly disclosed to be 0.5-5.0; and wherein ORP is broadly disclosed to be 200-1000 mV. In particular, EP 640 discusses the advantages of a wide pH range in order to accommodate a composition of the treatment bath. In fact, EP 640 specifically discloses a preference for pH higher than 4.0. See EP 640 at paragraph [0218]. Additionally, EP 640's overly broad disclosure of 200-1000 mV ORP fails to specify the criticality of an ORP of greater than 770 mV. Each of Examples 1-5 of Table 8 in EP 640 discloses an ORP of less than 400 mV. This makes sense because EP 640 discloses a method in which reactions for other than film formation occur in the bath.

In response, EP '640 teaches that the oxidation-reduction potential (ORP) of said phosphate chemical treatment bath indicated as the potential relative to a standard hydrogen electrode is maintained at 770 mV to 960 mV (= 200-1000 mV) [page 24, Table 5] and the phosphate chemical treatment bath has a pH of 2 or lower (= a pH of 0.5-5.0) [page 20, [0189]]; page 22, [0218]; and page 24, Table 5]. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists (MPEP § 2144.05(I)).

The disclosure of reference must be considered for what it fairly teaches one of ordinary skill in the art, pertinence of non-preferred disclosure must be reviewed in such light. *In re Meinhardt* 157 USPQ 270 (MPEP § 2123 and § 2141.02(VI)).

Applicants state that for example, Fe proceeds to Fe^{3+} which causes sludge.

Nowhere does EP 640 disclose prohibiting the formation of excess Fe^{3+} , thereby prohibiting non-film forming reactions. Likewise, EP 640 nowhere discloses substantially separating NO_2 and N_2O_4 from the treatment bath.

In response, Fe^{3+} and NO_2 and N_2O_4 are as discussed above.

There is no requirement that the claimed limitations be expressly articulated in one or more of the references. References are evaluated by what they collectively suggest to one versed in the art, rather than by their specific disclosures. *In re Simon* 174 USPQ 114 (CCPA 1972); *In re Richman* 165 USPQ 509, 514 (CCPA 1970).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to EDNA WONG whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edna Wong/
Primary Examiner
Art Unit 1795

EW
December 29, 2009